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ADDENDUM

13.5 STARTING WITH SERIAL #U06081

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13.5 Starting With SERIAL NUMBER U06081

1.0 INTRODUCTION

The Model 600 CLD Series Instruments starting with Serial Number U06081 have several new Hardware and Software features.

The Hardware includes the use of a new memory system, isolation of the analog output signals and 15 relays that are used to buffer the many new digital output signals that are now available. **SEE TABLE D**

The available digital signals consist of a SERVICE group, to externally monitor a number of parameters that provide insight for preventative maintenance and diagnostics decisions.

A second STATUS group, is provided to define the operation of the instrument such as Spanning, Zeroing, Calibrating and the Current Range (1, 2, 3, 4, AUTO).

The Software includes modifications to existing functions, changes to the Measurement screen, additional Short-Cut Keys and several New Functions that are listed as follows:

- **MEASUREMENT**

| | |
|---------------------|---------------|
| Over Range | 888888 |
| Zero | F5 |
| Span | F6 |
| Range Limits | F8 |
| Span Values | F9 |
| Outputs | F10 |

Note: The operator can use these Short-Cut Keys or continue to use existing procedures.

- **NEW FUNCTIONS**

| | |
|---------------------------------|---|
| Auto Startup | F5, F7, F7 |
| ALARMS | F5, F7, (Use F6 to toggle ON/OFF) |
| Offsets& Gains | F4, F3, F5 |
| D/A Calibration | F5, F7, F8 |
| Cal Analog Outputs | F5, F8, (Use F8 to toggle ON/OFF) |
| Save Data Archiving Time | F5, F7, F1, F5 (Use ENTER to change record time) |
| User Digital Outputs | F5, F9 |

- **MODIFICATIONS**

| | |
|-----------------------|--|
| Saved/Not good | F4, F2, F1 or F2 (To flow Zero or Span Gas) |
|-----------------------|--|

2.0 OPERATION OF MEASUREMENT KEYS

Note: The ← & → Keys continue to be used to view a complete list of menu items.

2.1 Over Range 888888

In the MEASUREMENT mode only, any value that exceeds the “range” by more than 10% will be displayed as 888888.

2.2 Diagnostics: Use **F3** to toggle between MEASUREMENT and DIAGNOSTIC.

2.3 Zero: From the MEASUREMENT Screen select the required range for calibration then press **F5**.

Note: For instruments with an internal Zero Solenoid select Calibration by Valves. (**Main, F5, F2, F4**)

| | |
|--|---|
| Manual Zero 4: SEND | Manual Zero 3: SMAN |
| Zero gas. Use F3 to Toggle Diagnostics. Cal Via | Zero gas. Use F3 To Toggle Diagnostics Cal Via *Using Current Temp & Press* |
| -375.00 NO | NOx 0.08 Range1: 100.0ppm |
| Range4: 3000ppm | |
| F1 Save value NO: -375.0 | F1 Save value NOx: 0.1 |
| F2 Man. Cal. Menu O2: 0.1 % | F2 Man. Cal. Menu O2: 0.0 % |
| Check Air EPC Coil V | Thu May 15 06:15:11 2008 |

2 versions

Zero Gas will be enabled and the observed results can be used to evaluate instrument performance.

Press **F3** to toggle to the Diagnostic screen for additional information

Press **F1** to save the value and complete a ZERO calibration for this channel and range

Press **MAIN, F1** to return to the MEASUREMENT screen to select other channels and ranges and repeat the process. Or press **F2** to return to the Manual Calibration Screen

2.4 Span: From the MEASUREMENT Screen select the required range then press **F6**.

Note: For instruments with an Internal Span Solenoid select Calibration by Valves. (**Main, F5, F2, F4**)

| | | | | | |
|--|--|-------------------|------------|--|--|
| Manual Span | | 5: SWET | | | |
| Span gas. Use F3 to Toggle Diagnostics. Cal Via | | | | | |
| - 375.00 | | | | | |
| NO | | Conc.: 1860.00000 | | | |
| Range4: 3000ppm | | | | | |
| F1 Save value | | | NO: -375.0 | | |
| F2 Man. Cal. Menu | | | O2: 0.1 % | | |

| | | | | | |
|---|--|-----------------|-----------|--|--|
| Manual Span | | 5: SWET | | | |
| Span gas. Use F3 To Toggle Diagnostics Cal Via *Using Current Temp & Press* | | | | | |
| 0.00 | | | | | |
| NOx | | Conc.: 90.00000 | | | |
| Range1: 100.0ppm | | | | | |
| F1 Save value | | | NOx: 0.0 | | |
| F2 Man. Cal. Menu | | | O2: 0.0 % | | |
| CAI Tel. (800) 959 0959 | | | | | |

2 versions

Span Gas will be enabled and the observed results can be used to evaluate instrument performance.

Press **F3** to toggle to the Diagnostic screen for additional information

Press **F1** to save the new value and complete the SPAN calibration for this Range.

Note: The span gas value used for this range is highlighted and can be changed if necessary. Use the Enter key and the numeric keys as required

Press **MAIN, F1** to return to the MEASUREMENT screen to select other ranges and repeat the process or press **F2** to return to the Manual Calibration screen

2.5 Range Limits: F8 From the MEASUREMENT Screen;

| Setup | | 5: SWET | |
|---------------------------|--|------------|--|
| Upper range limits [ppm] | | | |
| *** MUST be ASCENDING *** | | | |
| Range 1: | | 3.00 | |
| Range 2: | | 30.00 | |
| Range 3: | | 300.00 | |
| Range 4: | | 3000.00 | |
| *Do NOT Exceed Max Range* | | | |
| | | N0: -375.0 | |
| | | O2: 0.1 % | |
| Wed Jan 03 23:24:23 2001 | | | |

| Setup | | 1: SARA | |
|-------------------------------|--|-----------|--|
| Upper range limits [ppm] | | | |
| *** MUST be ASCENDING *** | | | |
| Range1: | | 100.00 | |
| Range2: | | 500.00 | |
| Range3: | | 1000.00 | |
| Range4: | | 3000.00 | |
| Maximum Range Limit: 3000.000 | | | |
| F1 Save with new | | N0x: 0.1 | |
| autorange Up/Down | | O2: 0.0 % | |
| CAI Tel. (800) 959 0959 | | | |

2 versions

The standard analyzer is factory configured with 4 Physical Ranges of 3, 30, 300, 3,000 PPM.

The optional high level analyzer is factory configured with 4 Physical Ranges of 5, 50, 500, 500

The operator can change the number of ranges and select a more convenient full scale concentration if required.

Note: Do not exceed the maximum range set by the factory and always use ascending order as shown.

- Example a) For a single range instrument, set Range 1 to the desired value and all others to zero
- b) For a two range instruments, set Range 1 to the lowest value, Range 2 to the highest value and the others to zero. .

2.6 Span Values: F9 From the MEASUREMENT Screen

| Setup | | 1: SARA | |
|-----------------------------|--|------------|---------|
| Span gas conc. range limits | | | |
| Range1: | | 2.250 | 3.00 |
| Range2: | | 18.500 | 30.00 |
| Range3: | | 186.500 | 300.00 |
| Range4: | | 1860.000 | 3000.00 |
| O2: | | 0.000 | |
| | | N0: -375.0 | |
| | | O2: 0.1 % | |
| Check Sample EPC Coil U | | | |

Use to define the concentration of the span gas that will be used to calibrate each range.

Note: The span gas value used for this range is highlighted and can be changed if necessary. Use the Enter key and the numeric keys as required.

2.7 Outputs: F10 From the MEASUREMENT Screen

| Output | Signal |
|--------|----------|
| 1 | NO |
| 2 | NOx |
| 3 | NO2 |
| 4 | RealTime |

NOx: 11.3

CAI Tel. (800) 959 0959

Use the ↓ to select the desired Output. Press Enter to select
Use the ↓ to select the desired Signal. Press Enter to select

Use this screen to define the signals and their location that will be monitored by a remote reordering device.

Note: NO₂ only active in the “Switching Mode”

SEE TABLE D

3.0 NEW FUNCTIONS

3.1 Auto Start Up: (Main, F5, F7, F7)

| Auto Startup | | 5: SWET | ≡ |
|--------------------|---|-----------|---|
| .Auto Startup | : | Off | |
| .Wait for [min] | : | 1 | |
| .Calibrations | : | 2 | |
| .Startrange | : | 4 | |
| .Access Level | : | 4 | |
| .Remote/Manual | : | Manual | |
| .NO/NOx-Mode | : | NO | |
| MAIN SAVE | | NOx: 22.5 | |
| BACK SAVE | | | |
| Check Air Pressure | | | ≡ |

All key analyzer parameters are stored in a secure memory location and retained when power is removed

In the event of an unexpected power failure it may be desirable to change some parameters until an operator can resume control.

This screen may be used to establish several desirable special instrument start-up parameters that define how the analyzer recovers from loss of AC power

When enabled this screen will define the following:

Wait: The time delay in minutes before proceeding. If “Zero” is selected the instrument will wait until all temperature warnings are cleared.

Calibrations: The number of attempts to complete a successful calibration as required in the operator defined Deviation Tables. If calibration is not successful the instrument will continue reporting results using the last completed calibration.

The analyzer will utilize the last completed calibration by selecting zero for Calibrations.

Starting Range: When all defined actions are completed the analyzer will return to the Measurement Screen and at the range specified.

Access Level: The user level at Start Up.

Remote/Manual: Put the analyzer in either “Remote” or “Manual” at Start Up

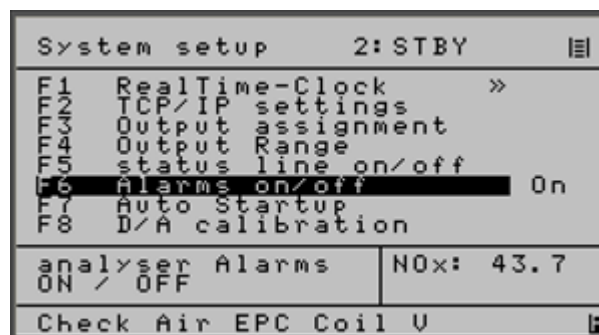
NO/NOx Mode: Put the analyzer in NO or NOx or NO2 mode at Start Up.

3.2 Alarms On/Off: (Main, F5, F7)

All key analyzer parameters are stored in a secure memory location and retained when power is removed. In the event of an unexpected power failure it may be desirable to change some parameters until an operator can resume control.

This screen may be used to establish several desirable special instrument start-up parameters that define how the analyzer recovers from loss of AC power.

When enabled this screen will define the following:



| System setup | | 2: STBY | ≡ |
|----------------------|--------------------|-----------|---|
| F1 | RealTime-Clock | » | |
| F2 | TCP/IP settings | | |
| F3 | Output assignment | | |
| F4 | Output Range | | |
| F5 | status line on/off | | |
| F6 | Alarms on/off | On | |
| F7 | Auto Startup | | |
| F8 | D/A calibration | | |
| analyser Alarms | | NOx: 43.7 | |
| ON / OFF | | | |
| Check Air EPC Coil V | | | |

Use **F6** to toggle ON/OFF

The instrument has an extensive library of warning messages that will aid in the identification of various anomalous events and are displayed at the bottom of the screen. These messages will assist in diagnostics and indicating the need for preventative maintenance

This screen provides an **option** to disable these messages during initial start-up or as may be desired for a particular application.

3.3 Offset & Gain: (Main, F4, F3, F5)

| Offset and Gain | | |
|------------------------------|--------|----------|
| Zero/Span applied correction | | |
| | Offset | Gain |
| Range1: | 0.00 | 1.00 |
| Range2: | 0.00 | 1.00 |
| Range3: | 0.00 | 1.00 |
| Range4: | 0.00 | 1.00 |
| | | N0: -0.8 |
| Thu May 03 12:40:03 2007 | | |

This screen can be used to provide an additional means to display calibration deviations.

The OFFSET is the value stored during zero calibration.

The GAIN is the value stored during span gas calibration using the operator defined calibration gas.

An increasing or decreasing change to the OFFSET or GAIN when used in conjunction with "Deviations" will provide insight to both short and long term changes to system performance

Note: Reset calibration values will reset OFFSETS & GAINS to zero and 1 respectively

3.4 Calibrate the Analog Outputs: (Main, F5, F7, F8) D/A Calibration (Main, F5, F7, F3) Output Assignment

- **Overview**

The 600 CLD Series is designed to provide four analog outputs that can be configured as 0-1 VDC, 0-5 VDC, 0-10 VDC, 4-20 mA, or 0-20 mA.

This screen (**Main, F5, F7, F8**) is used to select the scaling of the current (mA) or voltage (1, 5, 10) range that is required by a remote recording device. The outputs can be calibrated to exactly match the results obtained on a PLC, Recorder, Data Logger or other remote recording device that may be connected to the analyzer.

The operator will first select the **OUTPUT ASSIGNMENT (Main, F5, F7, F3)** screen and choose the output that is set to be calibrated. By selecting "calibrate" as the output all outputs of interest may be selected. When calibration is completed, the operator will return the outputs to their original assignment.

The **D-A CALIBRATION** screen will then be used to complete the calibration procedure.

| output scaling 5:SDRY | | | ☰ |
|-----------------------------|--------|--------|-------|
| Calibrate D/A Outputs | | | |
| Output | Offset | Gain | mA |
| 1 | 1.8000 | 0.7000 | |
| 2 | 1.8000 | 0.7000 | |
| 3 | 1.8000 | 0.7000 | |
| 4 | 1.8000 | 0.7000 | |
| **Set Output-F3-Calibrate** | | | |
| MAIN / BACK SAVE | | NO: | 0.1 |
| FS F1:0% F5:100% | | O2: | 0.0 % |
| Mon Jan 01 01:13:03 2001 | | | |

This screen provides a section that is used to record the zero signal corrections (zero offset) and a second area to record the 100% signal corrections (Gain) for each of the four output signals that may be defined to develop a voltage or current signal.

Since this is a Digital to Analog conversion, the calibration will require the completion of a simple “trial and error” procedure. The operator will observe the results of a “zero” or “span”(Gain) signal generated by the analyzer to the remote recording device and select a correction factor. The operator will save this value and then observe the results on the attached remote recording device.

The process of selection and saving for “zero” and “span” will be repeated until a satisfactory calibration is achieved. For 0-1VDC, 0-5VDC, 0-10VDC and a 0-20 mA outputs the Offset and Gain values are independent and do not interact. With the 4-20 mA output, the “Offset (zero)” and “Gain (span)” values interact and may require a few more trials.

The following is a table of typical values that can be used for start points for offsets and gains for different output types

| OUTPUT | OFFSET | GAIN |
|---------|--------|-------|
| 0-20 ma | 0.000 | 0.927 |
| 4-20 ma | 1.820 | 0.740 |
| 0-1 V | 1.300 | 0.820 |
| 0-5 V | 1.100 | 0.820 |
| 0-10 V | 1.050 | 0.820 |

- Procedure

3.4.1 From the Main Menu press **F5,F7,F3**, to obtain following screen:

| assignment | | 1: SARA | ⏏ |
|------------|------------|------------|---|
| Output | Signal | | |
| 1 | NO | | |
| 2 | NOx | | |
| 3 | NO2 | | |
| 4 | SamplePres | | |
| | | NO: -375.0 | |
| | | O2: 0.1 % | |

3.4.2. Use the \uparrow to highlight the outputs that require calibration.

3.4.3. Press enter so you provide access to all the menu of signals that are available.
(Real Time, NO, NOx, Calibration, Sample Pressure, etc.)

3.4.4. Select Calibration and press **ENTER** to complete the selection.

Note: In the example below only Output 1 will be calibrated
Record the name of these signals, they will be restored.

| assignment | | 1: SARA | ⏏ |
|-------------------------|------------|-----------|---|
| Output | Signal | mA | |
| 1 | Calibrate | | |
| 2 | NOx | | |
| 3 | NO2 | | |
| 4 | SamplePres | | |
| | | NO: 0.1 | |
| | | O2: 0.0 % | |
| CAI Tel. (800) 959 0959 | | | |

Note: Any or all of the four outputs can be selected for calibration. This screen will not be used again until calibration has been completed.

3.4.5. Press **BACK** to return to the SYSTEM SETUP screen (**Main, F5, F7**)

3.4.6. Press **F8** to obtain the following screen

| output scaling | | |
|-----------------------------|--------|----------|
| Calibrate | D/A | Outputs |
| Output | Offset | Gain |
| 1 | 1.8000 | 0.7000 |
| 2 | 1.8000 | 0.7000 |
| 3 | 1.8000 | 0.7000 |
| 4 | 1.8000 | 0.7000 |
| **Set Output-F3-Calibrate** | | |
| MAIN / BACK SAVE | | NOx: 0.1 |
| FS F1: 0% F5: 100% | | |
| CAI Tel. (800) 959 0959 | | |

Main, F5, F7, F8

3.4.7. Use the \uparrow to select the desired output press **ENTER**.

3.4.8. Press **F1** to select a ZERO signal and observe the results on the remote device

3.4.9. Change the offset value press **BACK** to save the new value.

3.4.10. Press **F8** to return to the D-A Calibration screen and note the results on the remote device.

3.4.11. Repeat steps 3.4.8 thru 3.4.10 until a satisfactory ZERO calibration is achieved.

3.4.12. Complete steps 3.4.8 thru 3.4.10 for each of the remaining outputs that require calibration.

3.4.13. Press **F5** to produce a full scale (100%) signal.

3.4.14. Use the arrow keys to position the cursor at the require GAIN value.

3.4.15. Observe the results on the remote device and make a correction to the GAIN value for the output of interest. Press **BACK** to save this new value

3.4.16. Press **F8** to return to the D-A calibration screen

3.4.17. Observe the results on the remote device and repeat the steps to change the GAIN value by repeating steps 3.4.14 thru 3.4.16 as needed for each output.

3.4.18. Return to the OUTPUT Assignment screen **F5, F7, F3** from the main menu and change the output signals from CALIBRATE to their original values as defined in step 3.4.1.

3.5 Save Data Archiving Time (Main, F5, F7, F1, F5)

Archive Time is the Time in seconds between each set of data points. If “zero” no data is stored in the SEC data files. The SEC data files are in .CSV format for direct import into Excel. CAI can provide the tools necessary to download these files.

| Setup RTC | | 3: SMAN | ☰ |
|------------------|--------------------------|------------|---|
| F1 | Set time | | |
| F2 | Set autocalibration time | | |
| F3 | Select calibration range | | |
| F4 | Autocalibration on/off | | |
| F5 | Save Data Archiving Time | | |
| | Archive Time(secs) | 10 | |
| F10 | Show time | | |
| Archive Interval | | N0: -286.8 | |
| 0 = Off | F5: SAVE | 02: 0.1 % | |

Use ENTER to change recording time

SEE TABLE A

TABLE A**600 SERIES CLD DATA ARCHIVE FILES**

Time,
Date,
Month,
Year,
Error Index,
TimeStamp,
NO Conc,
NO2 Conc,
NOx Conc,
NH3 Conc,
Concentration,
Detector Volts,
Range,
Auto / Manual,
Span Gas,
Offset,
Gain,
Sample Pressure,
Sample Flow,
Sample EPV Volts,
Air Pressure,
Ozone Flow,
Ozone EPC Volts,
Diode Temp,
Cell Temp,
Oven Temp,
Pump Temp,
Converter Temp,
Dryer Temp,
O2 Detector Temp,
NH3 Conv Temp,
O2 Concentration,
O2 Detector Volts,
O2 Offset,
O2 Gain,
Wet / Dry,
Meas Mode,
Local / Remote,
Converter

3.6 User Digital Outputs

- **Overview**

The 600 CLD Series of instruments have 15 solid state, optically coupled, isolated relays that can be programmed by the operator to indicate the status of numerous digital conditions

The available digital signals consist of a SERVICE group, that can be used to externally monitor a number of conditions to aid in preventative maintenance and diagnostics. **SEE TABLE B & D**

A second STATUS group, is provided and is used to define the operation of the instrument such as Spanning, Zeroing, Calibrating and the current Range (1, 2, 3, 4, AUTO) etc. **SEE TABLE C & D**

The individual output signals can be operator selected and set to a **HOLD** or **CLEAR** mode.

In the **HOLD** mode an activated signal is retained until the operator returns to the **Digital Output Screen** and selects the appropriate output signal and performs a manual CLEAR. After performing a Clear Operation, the operator must press F2 again to put the outputs back into the Hold mode.

| User DO I | | 4: SENO | ☰ |
|--------------------------|--------------|----------------|---|
| 1 | Off | | |
| 2 | Off | | |
| 3 | Off | | |
| 4 | Off | ***** | |
| 5 | Off | *Set Unused * | |
| 6 | Off | *Channels Off* | |
| 7 | Off | ***** | |
| F2 | Hold / Clear | | |
| F1 8 to 15 DO's | | NO: 0.1 | |
| MAIN/BACK to SAVE | | O2: 0.0 % | |
| Mon Jan 01 01:40:39 2001 | | | |

In the **CLEAR** mode the signal will automatically change state when the microprocessor detects that the noted condition no longer exists.

| User DO II | | 5: SDRY | ☰ |
|-------------------------|-----|----------------|---|
| 8 | Off | | |
| 9 | Off | | |
| 10 | Off | | |
| 11 | Off | ***** | |
| 12 | Off | *Set Unused * | |
| 13 | Off | *Channels Off* | |
| 14 | Off | ***** | |
| 15 | Off | | |
| F1 1 to 7 DO's | | NO: 0.1 | |
| MAIN/BACK to SAVE | | O2: 0.0 % | |
| CAI Tel. (800) 959 0959 | | | |

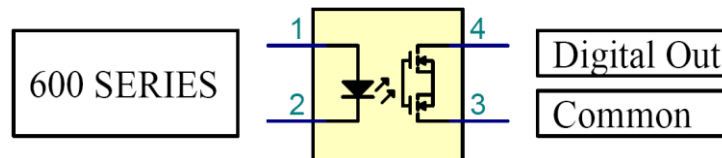
The operator can select from the following the desired **SERVICE** or **STATUS** groups that are to be digitally monitored.

TABLE B

| Index | Service Group | User DO Screen Display |
|--------------|--|-------------------------------|
| 0 | | |
| 1 | Sample Pressure Failure | SampleP |
| 2 | Air Pressure Failure | AirP |
| 3 | Oven Temp Failure (hclD only) | OvenT |
| 4 | Converter Temp Failure | ConvT |
| 5 | Pump Temp Failure | PumpT |
| 6 | Diode Temp Failure | DiodeT |
| 7 | Cell Temp Failure | CellT |
| 8 | Peltier Gas Temp Failure (hclD only) | DryT |
| 9 | O ₂ Temp Failure (650 only) | O ₂ T |
| 10 | EPC Coil Sample Failure | SEV |
| 11 | EPC Coil Air Failure | AEV |
| 12 | Range overflow | OR |
| 13 | ADC Range Overflow | AO |
| 14 | ADC Range Underflow | AU |
| 15 | Range 1 is not calibrated | R1NC |
| 16 | Range 2 is not calibrated | R2NC |
| 17 | Range 3 is not calibrated | R3NC |
| 18 | Range 4 is not calibrated | R4NC |
| 19 | Reaction chamber pressure | RCP |
| 20 | Low concentration Warning | LoC |
| 21 | High concentration Warning | HiC |
| 22 | NH ₃ Converter Temp Failure (605 only) | NH ₃ T |
| 23 | dummy text for RTC | Off |
| 24 | General Alarm | GenAlarm |
| 26 | Cal Alarm | CalAlarm |

TABLE C

| Index | Status Group | User DO Screen Display |
|-------|-------------------------|------------------------|
| 25 | In Remote | InRem |
| 27 | AutoRange | AutoR |
| 28 | Range 1 | R1 |
| 29 | Range 2 | R2 |
| 30 | Range 3 | R3 |
| 31 | Range 4 | R4 |
| 32 | In Calibrate | InCal |
| 33 | In Zero | Zero |
| 34 | In Span | Span |
| 35 | In Sample | Sample |
| 36 | In NO Mode | InNO |
| 37 | In NOx Mode (605 only) | InNOx |
| 38 | In Wet Mode (HCLD only) | InWet |
| 39 | In Overflow (not used) | InOflow |
| 40 | In NH3 Mode (605 only) | InNH3 |

TYPICAL RELAY

These contacts (3, 4) will drive continuously up to 500 MA using a customer voltage supply that does not to exceed 60 VDC.

- OPERATION

Use **(Main, F5, F9)** to select the first seven outputs.
 Use the \uparrow to select the desired output.
 Press ENTER and use \uparrow to select desired item.
 Press ENTER to save selection

Note: The 600 CLD has 15 user selectable isolated digital outputs from the list of 40 in **TABLE B & C**

| User DO I | 4: SEND | |
|--------------------------|---------|----------------|
| 1 | Off | |
| 2 | Off | |
| 3 | Off | ***** |
| 4 | Off | *Set Unused * |
| 5 | Off | *Channels Off* |
| 6 | Off | ***** |
| 7 | Off | |
| F2 Hold / Clear | | |
| F1 8 to 15 DO's | | NO: 0.1 |
| MAIN/BACK to SAVE | | O2: 0.0 % |
| Mon Jan 01 01:40:39 2001 | | |

Press **F1** to observe the remaining eight outputs
 Program as desired per the above

| User DO II | 5: SDRY | |
|-------------------------|---------|----------------|
| 8 | Off | |
| 9 | Off | |
| 10 | Off | |
| 11 | Off | ***** |
| 12 | Off | *Set Unused * |
| 13 | Off | *Channels Off* |
| 14 | Off | ***** |
| 15 | Off | |
| F1 1 to 7 DO's | | NO: 0.1 |
| MAIN/BACK to SAVE | | O2: 0.0 % |
| CAI Tel. (800) 959 0959 | | |

3.7 Cal Analog Output: (Main, F5, F8,)

| Measure setup 4: SENO | |
|---------------------------|---------------------|
| F1 | Lowpass filter Tc |
| F2 | Purge time |
| F3 | T + P compensation |
| F4 | Set dual-mode times |
| F8 | Cal Analog Out On |
| F9 | Ignite on power up |
| set analog out during cal | NO: 42.5 |
| Tue May 15 08:47:49 2007 | |

Use F8 to toggle on/off

Normally, during Auto Cal the Sample and Hold Outputs NO, NOx and NO2 are held at the last process value. If Cal Analog Output is set "On" then the values are not held, and the Real Time value is Output.

4.0 CHANGES TO EXISTING FUNCTIONS

4.1 Saved or Outside Limits

During Manual Calibration the following screens will be displayed to indicate the instruments response to the value of the zero or span gas using the amount that the operator defined in the deviation table.

| Manual Zero 3:SMAN | |
|--|-----------|
| Zero gas. Use F3 To Toggle Diagnostics Cal Via *Using Current Temp & Press* ***Saved Current*** | |
| NOx - 0.00 Range1: 100.0ppm | |
| F1 Save value | NOx: -0.0 |
| F2 Man. Cal. Menu | O2: 0.0 % |
| Thu May 15 06:16:17 2008 | |

| Manual Span 1:SARA | |
|---|-----------|
| Span gas. Use F3 To Toggle Diagnostics Cal Via *Using Current Temp & Press* Outside Deviation Limits | |
| NOx 0.08 Range1: 100.0ppm | |
| F1 Save value | NOx: 0.1 |
| F2 Man. Cal. Menu | O2: 0.0 % |
| Thu May 15 06:18:22 2008 | |

The above is shown using Zero Gas

From Measurement use: **F5 “Zero” or F6 “Span”**
From Main Menu use: **F4, F2, F1 “Zero” or F2 “Span”**

4.2 Calibration Deviations.

MAIN, F5, F2, F2 Deviations, F3 Measuring Deviations.

| Setup 5: SWET | | |
|---------------|----------|-----------|
| Deviations[%] | | |
| | absolute | relative |
| Range1: | 10.00 | 10.00 |
| Range2: | 10.00 | 10.00 |
| Range3: | 10.00 | 10.00 |
| Range4: | 10.00 | 10.00 |
| | | NOx: -0.0 |

| Setup 1: SARA | |
|------------------------|------|
| Measuring deviation[%] | |
| Range1: | 1.00 |
| Range2: | 1.00 |
| Range3: | 1.00 |
| Range4: | 1.00 |
| NOx: 0.0 | |

Note: These screens are used by the operator to define the maximum acceptable limits of the Zero and Span gas for both Manual and Automatic Calibrating.

4.3 Flow Zero or Span

Some analyzers have the above and the ability to flow Zero and Span Gas.

| Manual calib 3: SMAN | |
|------------------------------|-----------|
| F1 Cal zero | 0.08 |
| F2 Cal span | ZERO |
| F3 Toggle zero | |
| F4 Toggle span | |
| F5 Measurements | |
| F6 Cal zero 02 | |
| F7 Cal span 02 | |
| F8 Range Up ** F7 Range Down | |
| Range1: 100.0ppm | NOx: 0.1 |
| | O2: 0.0 % |
| CAI Tel. (800) 959 0959 | |

| Manual calib 1: SARA | |
|------------------------------|-----------|
| F1 Cal zero | 0.08 |
| F2 Cal span | SPAN |
| F3 Toggle zero | |
| F4 Toggle span | |
| F5 Measurements | |
| F6 Cal zero 02 | |
| F7 Cal span 02 | |
| F8 Range Up ** F7 Range Down | |
| Range1: 100.0ppm | NOx: 0.1 |
| | O2: 0.0 % |
| Thu May 15 06:22:23 2008 | |

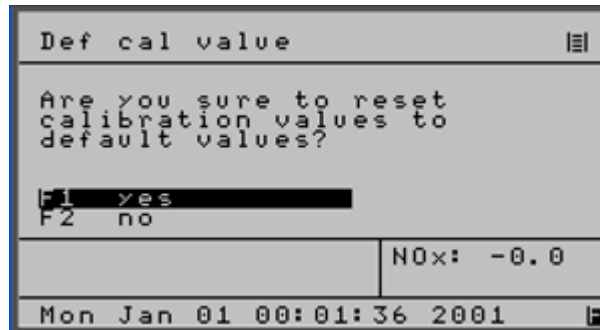
The above is shown using Zero/SPAN Gas

From Cal Screen use: **F2 or Main or Back**

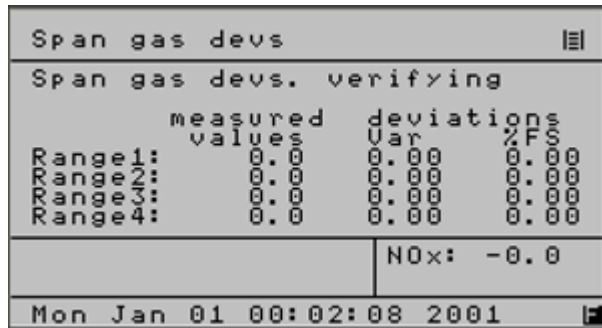
From Main Menu use: **F4, F2**

4.4 Reset Calibration Values

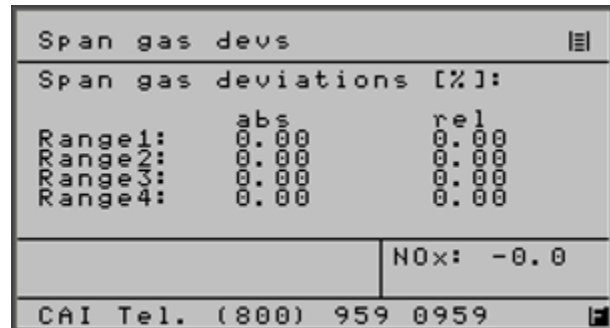
When the re-set calibrations value function is used all recorded deviations will be set to zero



Main, F4,F5



Main,F4 F3, F4
(Used to observe Auto Cal Results)



Main, F4, F3, F2
(Used to observe Manual Cal results)

The above are the new deviations after the operator elects to re-set the calibration values

TABLE D**600 SERIES CLD IO CHART****28 PIN MAIN CONNECTOR ASSIGNMENTS**

AO = Analog Output, OC= Open Collector, SV = Solenoid Valve TTL = Transistor Logic

| OPTO I/O | Signal Type | 600 CLD/HCLD Analog | | Levels |
|-----------------|--------------------|----------------------------|------------------------------|----------------------------------|
| ALG 1 | | pin # | | |
| COM | A Output | 1 | GND (Isolated analog) | Isolated AI |
| 0 | A Output | 2 | User Defined AO-1 | 1v,5v,10v,mA |
| 1 | A Output | 3 | User Defined AO-2 | 1v,5v,10v,mA |
| 2 | A Output | 4 | User Defined AO-3 | 1v,5v,10v,mA |
| 3 | A Output | 5 | User Defined AO-4 | 1v,5v,10v,mA |
| DIG 1 | | Digital | | |
| COM | D Output | 6 | GND (Digital) | |
| 0 | D Output | 7 | Sense Auto Range | TTL-low true |
| 1 | D Output | 8 | Sense Range 1 | TTL-low true |
| 2 | D Output | 9 | Sense Range 2 | TTL-low true |
| 3 | D Output | 10 | Sense Range 3 | TTL-low true |
| | D Output | 11 | Sense Range 4 | TTL-low true |
| 5 | D Input | 12 | Set Auto Range | |
| 6 | D Input | 13 | Control Range 1 | |
| 7 | D Input | 14 | Control Range 2 | |
| 8 | D Input | 15 | Control Range 3 | |
| 9 | D Input | 16 | Control Range 4 | |
| 10 | D Input | 17 | Auto Cal | |
| 11 | D Input | 18 | Calibrate | |
| 12 | D Input | 19 | Zero | |
| 13 | D Input | 20 | Span | |
| 14 | D Input | 21 | Sample | |
| 15 | SPARE | | | |
| DIG 2 | | | | |
| 0 | D Output | 22 | Zero Gas Flow | OC (24vdc if internal SV) |
| 1 | D Output | 23 | Span Gas Flow | OC (24vdc if internal SV) |
| 2 | D Output | 24 | Sample Gas Flow | OC (24vdc if internal SV) |
| 3 | D Output | 25 | Local/Remote | TTL-low true |
| 4 | D Output | 26 | Read Cal Mode | TTL-low true |
| 5 | D Output | 27 | Reserved | |
| 6 | D Output | 28 | Reserved | |

TABLE D (CONT)**600 SERIES CLD IO CHART****28 PIN AUXILLIARY CONNECTOR ASSIGNMENTS****NO = Normally Open**

| OPTO I/O | Signal Type | CLD Analog | | LEVELS |
|------------------|----------------|----------------|---------------------------------|---|
| ALG 1 | Spare | pin # | | |
| COM 4 | A Input | 1 | GND (analog) | 0-10V 0-10V 9,10,11,12 use RTN 1 |
| 5 | A Input | 2 | External Analog 1 | |
| 6 | A Input | 3 | External Analog 2 | |
| 7 | A Output | 4 | GND (Isolated analog) | |
| | D Output | 5 | Relay RTN 1 | |
| DIG 3 | Alarms | Digital | | Status go CLOSED when active Alarms go OPEN when present |
| COM 0 | D Output | 6 | Relay RTN 2 | 13,14,15,16 use RTN 2 17,18,19,20 use RTN 3 21,27,28 use RTN 4 |
| 1 | D Output | 7 | Relay RTN 3 | |
| 2 | D Output | 8 | Relay RTN 4 | |
| 3 | D Output | 9 | User Defined NO Relay 1 | |
| 4 | D Output | 10 | User Defined NO Relay 2 | |
| 5 | D Output | 11 | User Defined NO Relay 3 | |
| 6 | D Output | 12 | User Defined NO Relay 4 | |
| 7 | D Output | 13 | User Defined NO Relay 5 | |
| | D Output | 14 | User Defined NO Relay 6 | |
| 8 | D Output | 15 | User Defined NO Relay 7 | |
| 9 | D Output | 16 | User Defined NO Relay 8 | |
| 10 | D Output | 17 | User Defined NO Relay 9 | |
| 11 | D Output | 18 | User Defined NO Relay 10 | |
| 12 | D Output | 19 | User Defined NO Relay 11 | |
| 13 | D Output | 20 | User Defined NO Relay 12 | |
| 14 | D Output | 21 | User Defined NO Relay 13 | |
| 15 | D Output | 22 | Reserved Do Not Connect | |
| DIG 2 | | | | |
| 7 | D Input | 23 | Set Wet Mode | |
| 8 | D Input | 24 | Set Overflow | |
| 9 | D Input | 25 | Set NO Mode | |
| 10 | D Input | 26 | Set Remote | |
| 11 | D Output | 27 | User Defined NO Relay 14 | |
| 12 | D Output | 28 | User Defined NO Relay 15 | |